

**Five-Year Review Report
A.O. Polymer Superfund Site
Sparta Township
Sussex County, New Jersey**



Prepared by:

**United States Environmental Protection Agency
Region 2
New York, New York**

September 2003

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name (from WasteLAN): A.O. Polymer

EPA ID (from WasteLAN): NJD030253355

Region: 2

State: NJ

City/County: Sussex

SITE STATUS

NPL Status: ☐ Final ☒ Deleted ☐ Other (specify) _____

Remediation Status (choose all that apply): ☒ Under Construction ☐ Constructed ☒ Operating

Multiple OUs? NO

Construction completion date: 5/08/98

Are portions of the site and/or investigated adjacent properties in use or suitable for reuse? Yes, adjoining commercial and residential as well as a park have been investigated and are currently in use. In addition, a portion of the site has been deleted from the NPL and plans are underway for its reuse.

REVIEW STATUS

Lead agency: ☐ EPA ☒ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Rich Puvogel

Author title: Remedial Project Manager

Author affiliation: EPA

Review period: 05/08/1998 - 09/24/2003

Date(s) of site inspection: N/A Daily operating facility

Type of review:

☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion ☐ Statutory ☒ Policy

Review number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering action:

☐ Actual RA Onsite Construction at OU # 5/8/98

☐ Actual RA Start at OU# 1

☒ Construction Completion

☐ Previous Five-Year Review Report

☐ Other (specify) _____

Triggering action date (from WasteLAN): 5/8/1998

Due date (five years after triggering action date): 05/08/2003

Does the report include recommendation(s) and follow-up action(s)? ☐ yes ☒ no

Is human exposure under control? ☐ yes ☐ no

Is contaminated groundwater under control? ☒ yes ☐ no

Is the remedy protective of the environment? ☒ yes ☐ no

Acres in use or suitable for reuse: .42 acres restricted 3.76 acres unrestricted.

1.0 Introduction

This is the first five-year review for the A.O. Polymer Superfund site (Site), located in Sparta Township, Sussex County, New Jersey. This review was conducted by U.S. Environmental Protection Agency (EPA) Remedial Project Manager (RPM), Rich Puvogel. This review was conducted in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of five-year reviews is to assure that implemented remedies protect public health and the environment and that they function as intended by the decision documents. This report will become part of the site file.

The evaluation described herein assesses the protectiveness of the selected remedy for the A.O. Polymer site. The June 23, 1991 Record of Decision (ROD) called for two distinct technologies to address the Site's contamination, one which addresses subsurface soil contamination above the groundwater table in the former waste lagoon area (Disposal Area), and the other addresses the groundwater contamination. The soil contamination is the source of the groundwater Volatile Organic Compound (VOC) contaminant plume and is addressed under a source control alternative, while the groundwater contamination is addressed under a management of migration alternative. EPA issued one ROD for the two media.

The Site was divided into two portions, the Disposal Area and the Facility Area. EPA and the State of New Jersey Department of Environmental Protection (NJDEP) addressed minor contamination, soil, drums and other miscellaneous items, on the Facility Area via their removal programs. The Facility Area was deleted from the National Priorities List (NPL) on August 26, 2000. The remedial response actions described in the 1991 ROD address all known soil and groundwater contamination at the Disposal Area of the site and are the final remedial actions contemplated for the Site.

The remedial action objective for the site, including the Disposal Area and the groundwater, is unlimited use without restriction. This objective has already been attained for the Facility Area. This objective may take many years to achieve. Until that objective is reached, five-year reviews will be required.

2.0 SITE CHRONOLOGY

Chronology of Events

Event	Date
Operator of the site, expands business from the manufacture of resins to include solvent reclamation.	1964
Citizens living and working near the Site register first complaints of odors emanating from the Site and well water.	1973
Complaints of odors and bad smelling well water intensify, touching off formal investigations by the Sparta Health Department and NJDEP.	1978
Owners of affected wells in the vicinity of the site file claims to the New Jersey Hazardous Spill Fund and are subsequently connected to the municipal water supply.	1979
Cleanup at the Site was initiated by NJDEP including removal of 1,150 drums and excavation and removal of 1,700 cubic yards of contaminated soil in the Disposal Area.	1980
NJDEP installed monitoring wells in and around the site.	1982
Site was placed on the National Priorities List.	1983
The Remedial Investigation and Feasibility Study was initiated by NJDEP.	1984
Record of Decision for soil and groundwater remedy was issued.	1991
Production activities at the facility cease and the Site operator abandons unsecured hazardous material on the Facility Area of the Site.	1994
Construction of the soil remediation system (soil vapor extraction) is completed and was operational and functional.	1995
ESD was issued, modifying the ROD to allow the use of an air stripper in the groundwater treatment process.	1996
Construction of the groundwater treatment system was completed.	1998
EPA removal activities at the Facility Area of the Site were completed resulting in the removal 34,000 pounds of hazardous waste.	1998
Facility Area of the Site was deleted from the NPL	2002

3.0 Background

3.1 Site Location and Description

The Site is an inactive facility located at 44 Station Road in the Township of Sparta, Sussex County, New Jersey. The Site occupies 4.18 acres near the Sparta Rail Road Station along the New York, Susquehanna and Western (NYS&W) Railway. The Site is bounded to the north and east by Station Park, a municipal recreation area, to the southeast by Station Road, and to the south and west by the NYS&W Railway. The Site is located on two lots delineated by a Sussex County tax map as Block 19, Lot 45-B (3.22 acres) and Lot 45-C (0.96 acres).

EPA divided the Site into two separate portions, the Facility Area and the Disposal Area. Structures at the 3.76 acre Facility Area portion included office and laboratory facilities, a main reactor building, assorted storage buildings, and a non-contact cooling water pond. The office, reactor building, and laboratory were used by A.O. Polymer in its manufacturing processes. The cooling water pond, which is located in the southeast quadrant, has no surface outlet, and is lined with concrete. It was used for the recirculation of non-contact cooling water and was periodically replenished with water from an on-site production well. The 0.42-acre Disposal Area contained the old disposal pits.

In accordance with 40 CFR 300.425(e) and the Notice of Policy Change: Partial Deletion of Sites Listed on the National Priorities List 60 Federal Register 55466 (Nov. 1, 1995), EPA deleted the Facility Area portion of the Site from the NPL on August 26, 2000, and this area is available for unrestricted use. Hence, only the Disposal Area portion of the Site and groundwater plume remain on the NPL and are subject to evaluation in this Five Year Review.

3.2 Site-Specific Geology

The region surrounding Sparta, New Jersey is underlain by many rock types. Pre-Cambrian rocks form the hills to the west and Sparta Mountains to the east of the town. The Wallkill River Valley is underlain by a combination of Cambrian Hardystone and Cambro-Ordovician Kittatinny Limestone of which the Allentown Formation is of most importance. The Allentown Formation is a thick, rhythmically bedded, impure dolomite that locally contains significant amounts of groundwater.

Sussex County is located in the New Jersey Highland Physiographic Province. This area is characterized by linear valleys and ridges, predominantly trending northeast and southwest. This linearity is the result of two major tectonic upheavals which severely deformed the entire region. As a result, bedrock is highly deformed by both folding and faulting.

The Site is situated atop a small hill in the center of the valley, possibly a remnant of a stratified drift deposited by glacial meltwater. Water level measurements indicate that the top of the water table is approximately 20 feet below grade beneath the A.O. Polymer property. Depth to the top of the water table decreases to the north and east until, in Station Park next to the Wallkill River, it is only 2.6 feet below the ground surface. Glacial deposits consisting of silts, sands, gravel and boulders comprise the water table aquifer. The water table aquifer extends down to the top of the bedrock at a depth ranging from 17 to 123 feet. In addition to being highly fractured and weathered, the bedrock also has locally significant solution cavities. This bedrock, also known as the Allentown Formation, is a source of potable water in the Wallkill Valley.

3.3 Hydrogeology

The water table beneath the Site property is approximately 20 feet below grade. Depth to the water table decreases to the north and east of the property, until it is only 2.6 feet below the surface in Station Park next to the Wallkill River. RI data show that both the water table and bedrock aquifers are hydraulically interconnected and that groundwater contamination from the site has moved downward through the glacial overburden, and migrated from the site through the shallow portions of the Allentown formation.

The RI data has defined the latitudinal (east - west) and longitudinal (north - south) extent of the groundwater contaminant plume. The northernmost boundary of the plume is 400 feet north of the site, and the southernmost boundary of the plume does not appear to extend past the southern boundary of the site, refer to map, Attachment 2. Latitudinally, the plume appears to have stabilized. The plume emanates from the Disposal Area and extends to the Wallkill River in the east/northeasterly direction. The plume is confined to relatively shallow portions of the groundwater flow system and

is discharged to the river along with the normal groundwater flow. The downgradient extent of the plume from the Disposal Area is limited by the Wallkill River. Transport past the river is not indicated by the data and appears to be unlikely given present hydrologic conditions. The Wallkill River is a groundwater discharge area, a fact that is corroborated by the apparent convergence of piezometric contours at the river and the upward gradients observed along both sides of the river. Furthermore, contamination in the deep wells on the east side of the river (opposite the site) has not been detected, suggesting that the plume is confined to relatively shallow portions of the flow system and is thus discharged to the river along with the groundwater.

3.4 Land and Resource Use

The Facility Area is now available for reuse, should an interested party want to develop it. The 0.42 acre Disposal Area remains on the NPL. The groundwater plume extends underneath the Station Park, which is not adversely affected by the groundwater contamination. The Township plans to construct a community center on land in Station Park above the plume. EPA recently sent a letter to the Township's Health Department advising them to take appropriate measures to ensure that VOC-vapors do not migrate into the building.

3.5 History of Contamination

From the early 1960s until 1978, the Site was the location of two businesses: Mohawk Industries (Mohawk), which operated a resins manufacturing and solvent reclamation facility; and later A.O. Polymer Corporation (A.O. Polymer), which continued the resins manufacturing processes of Mohawk. In 1978, the facility was purchased by A.O. Corporation, the parent corporation of A.O. Polymer. A.O. Polymer purchased the rights to manufacture resin products previously produced by Mohawk. A.O. Polymer continued to utilize the same processing machinery, storage vessels, and laboratories used by Mohawk. For approximately one year in 1978, A.O. Polymer also continued Mohawk's solvent reclamation process. The activities of these companies contaminated the soil and groundwater at the Site.

In 1980 and 1981, surficial cleanup at the Site was initiated by NJDEP, including the removal of surface drums and the excavation and removal of contaminated soil located in the

unlined lagoon area (i.e., the Disposal Area). The Disposal Area of the Site was reportedly excavated to a depth of approximately 10 feet and backfilled with clean soil. After the State's removal action, residual soil contamination from the Disposal Area was the major source of the groundwater contamination emanating from the site. The source area is located approximately 10 feet below the ground surface down to the water table at a depth of 25 feet. The estimated volume of contaminated soil is approximately 7,500 cubic yards. Subsurface soil analysis indicates that organic chemicals seeped from the lagoons into the unsaturated soil zone, also known as the vadose zone, and are now located within the pore spaces of the soil. The organic compounds retained in the soil pores are relatively mobile. These compounds desorb upon contact with infiltrated groundwater providing a relatively constant release of contamination to groundwater for as long as immiscible liquids remain. As a result, the contaminated vadose zone soils are likely to constitute a prolonged and significant source of groundwater contamination.

Groundwater contamination in the water table aquifer consists primarily of VOCs including carbon tetrachloride, chlorobenzene, methylene chloride, 1,1,1-trichloroethane. The compounds were detected at levels above the Federal and New Jersey Maximum Contaminant Levels (MCLs) for these compounds.

The main source of surface water contamination at the site is contaminated subsurface soils and groundwater. As residual subsurface soil contaminants enter the groundwater they eventually discharge to the wetland area and the Wallkill River.

The groundwater contaminant plume is presently discharging to the wetland area located on the west side of the river as well as the river itself, as evidenced by detections of 1,1-dichloroethene (1,1-DCE) and 1,2-dichloroethene (1,2-DCE) in surface water samples from the wetland and river. Eight surface water samples were taken from four points in the river and wetland. Samples taken upstream from the contaminant discharge plume are consistent with background levels. The only organic contaminants detected upstream of the groundwater plume discharge area were methylene chloride and acetone. It is believed that most VOCs entering the Wallkill River from the contaminated groundwater are quickly attenuated by dilution, volatilization and degradation as reflected by the low levels detected in the downstream samples. Direct contact

with water in the Wallkill River and the wetland provide minor opportunity for exposure.

The wetland area is located 1,600 feet northeast of the site and extends along the side of the river approximately 1,200 feet. Surface water samples from the wetland area have higher contaminant concentrations than the surface water samples collected from the Wallkill River. Concentrations of VOCs, including 1,2-DCE, dichloroethane, vinyl chloride, and trichloroethene were detected in surface water samples collected from the wetland.

Four sediment samples from the Wallkill River indicate the presence of one VOC, toluene, and one semi-volatile compound, di-n-butylphthalate, at levels above background. Background levels were determined by sampling sediments upstream of where the contaminated groundwater plume discharges to the Wallkill River.

3.6 Initial Response

Until 1994, A.O. Polymer continued to use the Facility Area for resins manufacturing operations.

Complaints of odors emanating from well water and air near the Site were first registered by citizens living or working near the Site in 1973. Complaints of odors and bad smelling well water intensified in 1978, touching off formal investigations by the Sparta Health Department and the NJDEP. In December 1978, NJDEP inspectors and Sparta Health Department officials collected samples from potable wells surrounding the Site. Analysis of these samples revealed the existence of VOCs in three domestic wells located along Station Road. In June 1979, the owners of the three affected wells filed damage claims with the New Jersey Hazardous Spill Fund, and in January 1980, these homes were connected to a municipal water supply.

In 1978, NJDEP began investigating reports of drum stockpiling at the Site. These investigations identified on-site waste disposal and storage practices as the source of groundwater contamination in residential wells. Waste handling practices included disposal of liquid chemical waste into unlined lagoons, improper storage of over 800 deteriorating drums, and burial of crushed and open drums containing waste materials including volatile and semi-volatile organic compounds.

In 1980 and 1981, surficial cleanup at the Site was initiated by NJDEP, including the removal of surface drums and the excavation and removal of contaminated soil located in the Disposal Area. The Disposal Area of the Site was reportedly excavated to a depth of approximately 10 feet and backfilled with clean soil. This cleanup resulted in the removal of 1,150 drums; 1,700 cubic yards of contaminated soil; and 120 cubic yards of crushed drums and debris.

Concern regarding the extent of groundwater contamination resulted in additional investigations by NJDEP. In January 1982, NJDEP's Division of Water Resources installed 11 monitoring wells on and adjacent to the Site to determine the extent of groundwater contamination. Sampling confirmed that contamination had reached the Allentown formation, which is a source of potable water in the area. Sampling also revealed that groundwater contamination had migrated to Station Park, 300 yards northeast of the Site.

On September 1, 1983, the Site was placed on the NPL.

Complaints of odors emanating from the Site continued throughout the 1980s. In response to repeated complaints from residents in the area, the NJDEP Division of Environmental Quality cited and fined the A.O. Polymer facility for air emission violations.

In 1984, a Remedial Investigation and Feasibility Study (RI/FS) was performed by NJDEP and funded by EPA through a Cooperative Agreement with NJDEP. During the RI, the Disposal Area was sampled. Soil samples taken from this area of the Site and compared with other soil samples taken from other portions of the Site led to the conclusion that the soil ten to twenty feet beneath the Disposal Area contained residual VOC contamination that acted as a source of contamination to the groundwater.

After initial indications of groundwater contamination were confirmed, NJDEP installed a network of 18 additional monitoring wells during the RI/FS. These 18 monitoring wells were installed in and around the Site to characterize the nature and extent of groundwater contamination. The RI/FS report confirmed that the source of groundwater contamination was located in the Disposal Area soil and the groundwater contamination threatened a drinking water aquifer. This contaminated soil area takes up approximately 0.42 acre of the Site and is bounded to the northwest and southwest by the Gun

Club access road and to the northeast and southeast by a steep embankment that adjoins the park property.

The area of groundwater contamination is approximately 1,000 feet long and 900 feet wide and extends from the Site to the Wallkill River. The majority of the groundwater contamination is located beneath Station Park.

On June 28, 1991, EPA and NJDEP completed the RI/FS and issued a Record of Decision (ROD), which selected a remedy to address contaminated soil at the Disposal Area and groundwater under both areas and extending off the Site. EPA selected Soil Vapor Extraction (SVE) to treat the source of the groundwater contamination (i.e., Disposal Area soil) and a groundwater extraction and treatment system to remediate the groundwater contamination.

3.7 Facility Area Response Actions

The 3.76-acre Facility Area contains structures, such as office and laboratory facilities, a main reactor building, assorted storage buildings, numerous storage tanks, and a non-contact water cooling pond.

In early 1994, production activities at the facility ceased and the Site operator left hazardous material improperly stored and unsecured on the Facility Area of the Site. In response to requests from the Township of Sparta Health Department, EPA initiated a removal action at the recently abandoned facility on April 27, 1994. Additional soil samples and waste samples were collected at the Facility Area during the removal action. Sample results indicated that hazardous substances contained in drums and tanks found at the Site were being released to the environment. EPA removal activities included removal of hazardous materials from the laboratory building, storage building, reactor building, some above-ground piping and tanks, as well as an underground storage tank.

During EPA's removal activities, 121 cubic yards of soil, 91 cubic yards of asbestos-containing materials, 34,000 pounds of hazardous waste, 37,600 pounds of non-hazardous waste, and 3,491 gallons of bulked hazardous liquids were removed from the Site.

After removal activities were completed, EPA collected confirmatory soil samples to determine if any remaining areas

of the Site were in need of remediation. An analysis of earlier RI/FS soil samples and the post-removal action soil samples taken on the Facility Area indicated that soil on the Facility Area does not exceed New Jersey Residential Direct Contact Soil Cleanup Criteria.

All of EPA's response actions at the Facility Area were conducted using funds from the Hazardous Substance Superfund.

3.8 Basis for Taking Action

The Site was placed on the NPL on September 1, 1983. In 1984, EPA began a Remedial Investigation and Feasibility Study (RI/FS) to determine the nature and extent of contamination at the Site. In Summary, the RI's risk analysis warranted a remedial response action to protect human health and the environment regarding the groundwater and the soil that continued to contaminate the groundwater.

4.0 Remedial Actions

4.1 Remedy Selection

Based on the results of the RI/FS, EPA issued a Record of Decision (ROD) on June 28, 1991, which selected two distinct technologies to address the contamination at the Site. The selected remedy called for a soil vapor extraction (SVE) system to remove VOC contamination from soil in the Disposal Area and a groundwater extraction and treatment system to address the contaminated groundwater through a system of extraction wells and treatment utilizing a powdered activated carbon filtration system.

4.2 Remedy Implementation

After the ROD was signed, EPA became the lead agency in charge of response activities at the Site. EPA identified Potentially Responsible Parties (PRPs) and issued a Unilateral Administrative Order to conduct the Remedial Design and Remedial Action (RD/RA). Design of the SVE system started on April 2, 1992 and was completed on May 11, 1994. By October 1994, construction of the SVE system was completed and the system was operational and functional in January of 1995. Both the SVE and groundwater extraction waste streams ran through separate treatment plants located on property adjacent to the A.O. Polymer property designated in the county tax records as Lot 45-A. In August of 2001, the PRP diverted the

recovered product from the SVE system to the Ground Water Treatment System (GWTS). Up to that point, approximately 5,205 gallons of product had been recovered from subsurface soil by the SVE system.

The groundwater treatment component of the selected remedy consisted of pumping the contaminated groundwater from the aquifer, treating it with a Powdered Activated Carbon Treatment (PACT) system and then returning the treated groundwater to the aquifer. Treatability studies conducted on the PACT system showed that this treatment system could not meet the discharge limitations; therefore, an Explanation of Significant Differences (ESD), issued on September 17, 1996, called for modifying the ROD to allow the use of an air stripper to remove contaminants from groundwater and allow surface water discharge to be implemented instead of using groundwater re-injection. In addition, the ESD called for only the most contaminated part of the plume to be treated via the extraction and treatment system, thereby allowing the remaining low level contaminant concentrations to naturally attenuate. The remedial design of the groundwater pump and treatment system started on April 2, 1992 and was completed on July 8, 1997.

Construction of the groundwater pump and treatment system was completed on March 1998.

On April 30, 1998, the NJDEP approved a Classification Exception Area (CEA) and a Well Restriction Area, for a portion of the Site. The CEA was established in accordance with N.J.A.C. 7:9-6.6, because constituent groundwater quality standards are not being met at this Site due to pollution caused by human activity. The Well Restriction Area was established to preclude withdrawal of the contaminated groundwater associated with this Site, except for the purposes of monitoring and/or additional treatment.

In 1999, EPA finalized negotiations with the PRP for the Groundwater Monitoring Plan that evaluates the effectiveness and protectiveness of the groundwater treatment remedy. In summary, AOP's Monitoring Plan calls for the monitoring of (4) Compliance Wells (CWs): AOP-9, AOP-110, MW-5, and AOP-108 and (2) Recovery Wells (RWs): RW-1 and RW-2. The recently installed RW-3 has been added to the Monitoring Plan. The CWs are the wells used to determine the compliance of the groundwater system. The PRP, via a groundwater model, generated Trichloroethene (TCE) concentration-curves for each

of the (4) CWs. The actual CW TCE concentrations must stay below the curves throughout the scheduled sampling, which demonstrates the PRP has established proper capture of the contaminated groundwater. If the TCE concentrations in the CWs exceed, or are anticipated to exceed the curves, the PRP must re-establish capture, via new extractions wells or other corrective measures. The PRP must also stay in compliance with all its air and water New Jersey discharge permits. The installation of RW-3 changed the size of the capture zone, thereby, relocating MW-5 to inside the new capture zone and rendering it useless as an effective CW.

In total, 6,984 gallons (69,840 lbs) of product have been removed from the soil and groundwater. At least 5,205 gallons of this product have been removed from the soil by the SVE system. During the remedial design, it was estimated that the implemented remedy would take about 13 years to achieve groundwater cleanup goals (*i.e.*, MCLs) in four down-gradient compliance monitoring wells. However, the goal of the groundwater component of the remedy is to achieve the cleanup goals in all monitoring wells and, therefore, additional treatment beyond 13 years may be required. The SVE system treats only the source of the groundwater contamination in soils, and it is likely that the SVE system could be turned off within the next five years.

4.3 System Operations/Operation and Maintenance (O&M)

EPA has an Unilateral Administrative Order with the PRP to operate and maintain the SVE and the groundwater capture and treatments system. To improve efficiencies of the two systems, condensate captured by the SVE system was diverted to the groundwater treatment system in September 2001. Steady O&M performance has resulted in an average throughout of 2.3 million gallons per month while strictly adhering to all sampling protocols and contaminant removal efficiencies, as well as the prescribed preventive maintenance requirements of the individual unit operations. The total annual cost, which varies year to year, has been approximately \$700,000 per year.

5.0 Five-Year Review Process

5.1 Administrative Components

The five-year review team consisted of Rich Puvogel (EPA-RPM), Robert Alvey (EPA-Hydrogeologist), Michael Sivak (EPA-Risk Assessor) and Mark Souders (NJDEP).

5.2 Community Involvement

The EPA Community Involvement Coordinator for the AOP site, Pat Seppi, published a notice in the New Jersey Herald, the area newspaper, on September 29, 2003, notifying the community of the initiation of the five-year review process. The notice indicated that upon completion of the five-year review, the document would be available to the public at the Sparta Public Library. In addition, the notice included the RPM's name, address and telephone number for questions related to the five-year review process or the AOP site in general.

5.3 Document Review

The documents, data, and information which were reviewed in completing this five-year review were the RI/FS, Deletion Docket, PRP letters and quarterly groundwater monitoring reports.

5.4 Data Review

As for the SVE system, it is assumed that until the VOC off-gas concentrations reach insignificant levels the system will continue to remove contamination from the soil and, therefore, will continue to operate. The most recent contaminant concentrations collected from the SVE system are presented in Table 1.

The PRP collects groundwater samples on a quarterly basis. As stated above, the TCE concentrations are plotted on graphs to determine if they exceed the modeled compliance curves. Table 2 provides general data on the groundwater treatment system and product recovery.

5.5 Site Inspection

The PRP routinely evaluates the effectiveness of the individual treatment units by sampling the groundwater passing through the treatment units. The plant operators are present on site seven days a week to make sure everything is functioning smoothly and all required testing and sampling is being done on schedule. Similarly, the PRP is on the site on a daily or weekly basis as needed to arrange the disposal of waste sludge, handle visitors as well as perform field activities such as sampling. Therefore there is no need to perform a specific site inspection for this Five-Year Review.

5.6 Interviews / Meetings

There is daily contact between the plant operators and the PRP's contractor personnel in charge of oversight. There is weekly contact between the EPA and the PRP's contractor. There have been numerous meetings, phone calls and correspondence with the PRP. An interview with the Sparta Township Health Officer, Ralph D'Aries was conducted on September 26, 2003. Mr. D'Aries indicated that there were no concerns raised about the effectiveness of the remedy. Mr. D'Aries mentioned that, since the Facility Area was de-listed from the NPL, there have been several inquiries from interested parties concerning the redevelopment of that parcel.

5.7 Transfer to the State

Since this is a Federal lead PRP site, transfer to the State is not applicable.

6.0 Remedy Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes. Soil contamination at the site was addressed mainly by the removal of contaminated soil. The soils in the disposal area are being addressed by an SVE system. Although the SVE system is operating longer than anticipated, it is functioning as intended by the decision documents and should continue to operate into the future.

As for the groundwater remedy, the past groundwater monitoring report results indicate that some of the compliance wells (i.e., AOP-109) may not meet compliance curves for at least one well and possibly two wells in the fall of 2003. It is expected that the system will be out of compliance at that time. Therefore, in November 2002, EPA directed the PRP to install a new extraction well to increase the capture of the groundwater from the source area. The PRP installed the new extraction well on November 19, 2002. EPA also directed the PRP to install new monitoring wells, once the new capture zone has been fully delineated, most likely in the fall of 2003. EPA also suggested the PRP begin a Monitored Natural Attenuation (MNA) program to assess natural attenuation conditions at the Site. Finally, EPA requested that the PRP sample 12 additional monitoring wells not designated for regular sampling in the monitoring plan. Nine of the twelve

wells are installed on the outer boundaries of the Site and 3 are closer to the Disposal Area. The sampling of these twelve wells was completed in April 2003. The results indicate that the 9 monitoring wells are non-detect for TCE and the 3 monitoring wells closer to the Disposal Area range from 1.5 to 7 ppm for TCE. The same wells were sampled in the mid 1990's and the TCE concentration range from 3 to 5 ppm. The results indicate that the extent of the plume has not increased.

Institutional controls are in place to prevent use of contaminated groundwater. The community is on public water that meets appropriate state and federal standards. No degradation of wetlands or flora in the vicinity of the site has resulted from site contamination.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and Remedial Action Objectives (RAOs) used at the time of the remedy still valid?

Prior to issuing the 1991 ROD, EPA used current risk assessment guidelines to evaluate the exposure assumptions and data relating to the Disposal Area and groundwater. This evaluation can be found in the June 23, 1991 ROD. Briefly, EPA determined that if the subsurface soil contamination were left in place, it would serve as a continuing source of groundwater contamination. Site related contaminants were detected in the drinking water aquifer at levels above the Federal and New Jersey Maximum Contaminant Levels (MCLs).

The remedial action for groundwater is expected to continue over the next five years, the period of time considered in this review. As a result, groundwater use is not expected to change during that period. The land use considerations and potential exposure pathways considered in the baseline human health risk assessment are still valid.

The evaluation of groundwater in this five-year review focused on two primary exposure pathways, direct ingestion (as a potable water source) and the possibility of vapor intrusion if buildings were to be constructed over the plume. The evaluation of the direct contact pathway showed that all nearby residents are receiving public water, and since there are no residential or public supply wells in the contaminated area, there is no exposure. Therefore, the remedy is protective for this exposure pathway. The remediation goals for groundwater identified in the ROD are New Jersey Safe Drinking Water Maximum Contaminant Levels. However, since

the time the ROD was signed, Groundwater Quality Standards (GWQS) have been promulgated by NJDEP. Table 3 provides a comparison of the Federal and State MCLs along with the GWQS. As shown in this table, the GWQS are the most stringent of these standards for toluene, 1,1,2-trichloroethane, and xylenes. Soil vapor intrusion was not evaluated in the original risk assessment. Due to the presence of VOCs in the shallow groundwater at approximately 10 - 15 feet below ground surface, this pathway should be evaluated to determine if vapor intrusion concerns are present.

Since the ROD was signed, EPA has developed several new toxicity values that allow for the derivation of chemical-specific remediation goals for contaminated media, including soils. The cleanup goals for soils provided in the ROD, 1 ppm for total VOCs and 10 ppm for total semivolatile organics, should be reevaluated to determine if they are protective in light of these newly developed toxicity values, for both potential direct-contact exposure pathways, and for protection of groundwater. This reevaluation needs to precede the shutdown of the SVE system, to determine whether additional treatment is required to assure that the remedy is protective. The SVE system may achieve the cleanup goals for soils established in the ROD within the next five years; therefore, EPA expects that this reevaluation of the soil cleanup goals will take place in the next five years.

Post-removal action soil samples taken on the Facility Area indicated that soil on the Facility Area does not exceed New Jersey Residential Direct Contact Soil Cleanup Criteria. As of this date, the SVE system and the groundwater pump and treatment system continue to remove contaminants from the soil and groundwater, are in compliance with the Monitoring Plan, and fulfill the RAOs. As stated above, it is anticipated that the groundwater capture system will fall out of compliance in the autumn of 2003. In response to this expectation, EPA has directed the PRP to take actions to modify the groundwater capture zone and increase the monitoring efforts. EPA will continue to monitor the capture of the groundwater plume and take additional measures as necessary.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy? No.

Remedy Assessment Summary

Based upon this five-year review, it has been found that:

- Contaminated site soils outside of the Disposal Area have been removed off site.
- Contaminated soils in the Disposal Area are being remediated by an SVE system, which is operating properly.
- There are no drinking water wells within the plume of contamination and none are expected because of existing state restrictions.
- Groundwater monitoring wells and recovery wells are functional. Operational adjustments are underway and the treatment system is operating properly.

7.0 Recommendations and Follow-Up Actions

This site has ongoing remedial activities including operating remedies, maintenance and monitoring activities. As expected by the decision documents, these activities are subject to routine modification and adjustment. This report includes some suggested modifications and adjustments. Additional modifications and adjustments may occur in the future. As described above, the ROD cleanup goals for soil need to be reevaluated, since new toxicological data has been released since the time of the ROD. This reevaluation needs to occur before the SVE system is shut down and removed from the site. There are no other recommendations or follow-up actions that suggest changing the remedy in order to protect public health or the environment.

8.0 Protectiveness Statement

Because the remedial actions taken pursuant to the ROD are protective, the whole site is protective of human health and the environment. To date, all the components of the Long-Term Response Action are working properly. Similarly, the groundwater plume is confined to the shallow aquifer and confined within the immediate vicinity of the site. The groundwater contaminants that are removed via the extraction/treatment facility are captured by a resin bed system and are drummed for removal from the site. Nothing harmful is released to the air or surrounding environment. Currently, there is no exposure of human and/or environmental receptors to site contaminants, and no exposures are anticipated over the next five years.

9.0 Next Review

The second five-year review for the AOP site should be completed by September 30, 2008

Approved:

George Pavlou, Director
Emergency and Remedial Response Division

Date

Table 3: Comparison of Groundwater Standards for Chemicals of Concern

Parameter	Federal MCL (ug/l)	NJ MCL (ug/l)	NJ GWQS (ug/l)	Lowest Concentration (ug/l)
Trichloroethene	5	1	1	1
1,2-Dichloroethane	5	2	--	2
1,1-Dichloroethene	7	2	2	2
cis-1,2-Dichloroethene	70*	10	10	10
trans-1,2-Dichloroethene	100*	10	100	10
Ethylbenzene	700*	--	700	700
Toluene	2000*	--	1000	1000
1,1,1-Trichloroethane	200	26	30	26
1,1,2-Trichloroethane	5*	--	3	3
Vinyl Chloride	2	--	5	2
Xylenes	10000*	--	--	10000

* Identified in the ROD as "Proposed MCL"